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BOTANY.¹

Holophytes and Hysterophytes.—For some time I have been using in my lectures, and occasionally in some botanical writings which have not yet appeared in print, the two words here given.

Every botanist has felt the need of a word which should express what we mean when we say "a green plant," or a "chlorophyll-bearing plant," and he has felt even more the need of a single term to express what he means when he says a "parasite or saprophyte," a "parasitic or saprophytic plant," or a "chlorophyll-less plant." The terms I have used are not strictly new. We already have "holophytic" with precisely the meaning I would give this form of the word. Hysterophyte has often been used with nearly the meaning I would restrict it to, and its older use has practically become obsolete. The words may well be restricted then as follows: "holophyte," a chlorophyll-bearing plant, which is neither parasitic nor saprophytic, i. e., an independent plant so far as its nutritive functions are concerned; "hysterophyte" a chlorophyll-less plant, either a parasite or a saprophyte, i. e., a dependent plant so far as its nutritive functions are concerned. The etymologies are so evident that I need not give them here.

CHARLES E. BESSEY.

The Microorganisms of Fermentation.²—The name of Professor Emil Chr. Hansen is connected with a reform in the industry based upon fermentations. The reform is spreading all over the civilized countries, and it is gradually entering into the wine-industry, and, recently, into the manufacturing of vinegar. Hansen's principle is to work in the brewery with *pure yeast*, and this principle will doubtless be extended to other manufacturing trades the underlying causes of which are life-activities of microorganisms.

The famous Carlsberg Laboratory, where Hansen works, and from where the Kjeldahl nitrogen method sprung, could, a few years ago, not accomodate all of the students that came from all parts of the world. Consequently Hansen's collaborator, Alfred Joergensen,

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²Joergensen, Alfred; *Microorganisms and Fermentation*. New edition, translated from the re-written and much enlarged third edition in German by Alex. K. Miller, Ph. D., F. I. C., and E. A. Lennholm, and revised by the author. With 56 illustrations. London, F. W. Lyon, Eastcheap Buildings, E. C., 1893. (pp. VIII + 257, 9x6).

established a laboratory for the purpose of giving specialists an opportunity of becoming acquainted with the new system, and, at the same time, supplying cultures to breweries. While Hansen worked mainly in the line of bottom fermentation, Joergensen worked with top fermentations.

All we who have had an opportunity of working with Joergensen, are well acquainted with his text-book; it is as thorough as its author and as familiar to us as our catechism.

Chapter I treats of microscopical and physiological examinations in the line of lower cryptogams; Ch. II of examinations of air and water, including Hansen's zymotechnical analysis of air and water; in Ch. III bacteria form the subject; Ch. IV contains the moulds, Ch. V (pp. 111-203) contains a full account of the alcoholic ferments, methods of analysis in this special line, and descriptions of the different species of *Saccharomyces* and their nearest relatives. In Ch. VI the application of the results of scientific research in practice (pp. 204-227) is set forth, and a bibliography and an index have finally been added.

Botanists are, as a general rule, too much absorbed by the questions of nomenclature, etc., to look into practical questions; therefore, we often see, in text-books, very singular remarks on the subject of fermentations. A book like Joergensen's text-book should not be absent from any laboratory, chemical or botanical, because fermentations are subjects of study in both places, and because the work in these lines is very instructive, both to botanists and to chemists. To the special attention of all of these, the book of Joergensen is most cheerfully recommended.

J. CHRISTIAN BAY.